WHAT IS CLAIMED IS:

1. An apparatus for producing a crystal article, comprising a crystal growth furnace having a crucible for holding a growth material, a heater for melting the growth material held in the crucible, and a moving means for moving the crucible relatively to the heater; the growth material melted in the crucible being cooled to effect crystal growth, wherein;

the crystal growth furnace is;

provided with a detector for detecting temperature of the growth material; and

controlled on the basis of changes in temperature detected by the detector.

2. The apparatus according to claim 1, wherein the detector is a thermocouple set to at least one of the crucible, a supporting rod of the crucible, and the heater.

3. The apparatus according to claim 1, wherein the detector is a thermocouple provided between the crucible and the heater.

4. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to make control so as to keep the rate of crystal growth from changing.

5. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to make control so as to keep the position of solid-liquid interface of the growth material from deviating.

6. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to change the rate of movement of the crucible.

7. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to lower the rate of movement of the crucible when a discontinuous change occurs in the temperature.

8. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to change temperature distribution of the crucible.

9. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to lower the temperature of the crucible at its bottom center when a discontinuous change occurs in the temperature.

10. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to vibrate the crucible.

11. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to vibrate the crucible when a discontinuous change does not occur in the temperature in spite of predetermined location or temperature of the crucible.

12. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to make control so as to keep the position of solid-liquid interface of the growth material from deviating when a discontinuous change ascribable to latent heat occurs in the temperature.

13. The apparatus according to claim 1, wherein the crystal growth furnace is so controlled that the isothermal face of the growth material is kept convex on the side of a liquid phase.

14. The apparatus according to claim 1, wherein the detector is provided in plurality in a plane that intersects the direction of crystal growth, and the crystal growth furnace is controlled in accordance with the temperature detected by the plurality of detectors.

15. The apparatus according to claim 1, wherein the detector is provided in plurality in a plane that intersects the direction of crystal growth, and the

crystal growth furnace is so controlled that the isothermal face of the growth material is kept convex on the side of a liquid phase, in accordance with the temperature detected by the plurality of detectors; and

the crystal growth furnace is so controlled that the degree at which the isothermal face of the growth material is kept convex is changed when a discontinuous change occurs in the temperature of the growth material.

16. An apparatus for producing a crystal article, comprising a crystal growth furnace having a crucible for holding a growth material, a heater for melting the growth material held in the crucible and a moving means for moving the crucible relatively to the heater; the growth material melted in the crucible being cooled to effect crystal growth, wherein;

the crystal growth furnace is;

provided with a plurality of detectors for detecting temperature of the growth material, which are provided in a plane that intersects the direction of crystal growth; and

controlled on the basis of the temperature detected by the plurality of detectors; being so controlled that the isothermal face of the growth material is kept convex on the side of a liquid phase.

17. The apparatus according to claim 16, wherein the crystal growth furnace is so controlled that the degree at which the isothermal face of the growth material is kept convex becomes low when a discontinuous change occurs in the temperature of the growth material.

18. An apparatus for producing a crystal article, comprising a crystal growth furnace having a crucible for holding a growth material, a heater for melting the growth material held in the crucible and a moving means for moving the crucible relatively to the heater; the growth material melted in the crucible being cooled to effect crystal growth, wherein;

the crystal growth furnace is;

provided with a measuring means for measuring the rate of heat flow in the crystal growth furnace; and

controlled on the basis of changes in heat flow rate measured with the measuring means.

19. The apparatus according to claim 18, wherein the measuring means has a plurality of temperature detectors provided at positions different from each other.

20. The apparatus according to claim 19, wherein the detectors are each a thermocouple set to at least

one of the crucible and a supporting rod of the crucible.

21. The apparatus according to claim 19, wherein the detectors are each a thermocouple provided between a supporting rod of the crucible and the heater.

22. The apparatus according to claim 18, wherein the controlling of the crystal growth furnace is to make control so as to keep the rate of crystal growth from changing.

23. The apparatus according to claim 18, wherein the controlling of the crystal growth furnace is to make control so as to keep the position of solid-liquid interface of the growth material from deviating.

24. The apparatus according to claim 18, wherein the controlling of the crystal growth furnace is to change the rate of movement of the crucible.

25. The apparatus according to claim 18, wherein the controlling of the crystal growth furnace is to lower the rate of movement of the crucible when a discontinuous change occurs in the heat flow rate.

26. The apparatus according to claim 18, wherein

the controlling of the crystal growth furnace is to change temperature distribution of the crucible.

27. The apparatus according to claim 18, wherein the controlling of the crystal growth furnace is to lower the temperature of the crucible at its bottom center when a discontinuous change occurs in the heat flow rate.

28. The apparatus according to claim 18, wherein the controlling of the crystal growth furnace is to vibrate the crucible.

29. The apparatus according to claim 18, wherein the controlling of the crystal growth furnace is to vibrate the crucible when a discontinuous change does not occur in the heat flow rate in spite of predetermined location or temperature of the crucible.

30. The apparatus according to claim 18, wherein the controlling of the crystal growth furnace is to make control so as to keep the position of solid-liquid interface of the growth material from deviating when a discontinuous change ascribable to latent heat occurs in the heat flow rate.

31. The apparatus according to claim 18, wherein

the crystal growth furnace is so controlled that the isothermal face of the growth material is kept convex on the side of a liquid phase.

32. An apparatus for producing a crystal article, comprising a crystal growth furnace having a crucible for holding a growth material, a heater for melting the growth material held in the crucible and a moving means for moving the crucible relatively to the heater; the growth material melted in the crucible being cooled to effect crystal growth, wherein;

the crystal growth furnace is;

provided with a detecting means for detecting generation of latent heat of the growth material; and

controlled on the basis of information given from the detecting means on the generation of latent heat.

33. A process for producing a crystal article, comprising producing the crystal article by means of the apparatus for producing a crystal article according to claim 1.

34. A process for producing a crystal article, comprising producing the crystal article by means of the apparatus for producing a crystal article according to claim 16.

35. A process for producing a crystal article, comprising producing the crystal article by means of the apparatus for producing a crystal article according to claim 18.

36. A process for producing a crystal article, comprising producing the crystal article by means of the apparatus for producing a crystal article according to claim 32.

37. A thermocouple provided in a crystal growth furnace for growing a fluoride crystal, the thermocouple comprising a pair of metal wires formed of materials different from each other, and a tube provided around at least one of metal wires;

the tube comprising a metal composed chiefly of tantalum or a ceramic composed chiefly of aluminum oxide.

38. An apparatus for producing a crystal article, comprising a crystal growth furnace having a crucible for holding a growth material of fluoride, a heater for melting the growth material held in the crucible and a moving means for moving the crucible relatively to the heater; the growth material melted in the crucible being cooled to effect crystal growth, wherein;

the crystal growth furnace is;

provided with a thermocouple comprising a pair of metal wires formed of materials different from each other, and a tube provided around at least one of metal wires; the tube comprising a metal composed chiefly of tantalum or a ceramic composed chiefly of aluminum oxide; and

controlled on the basis of temperature information attributable to the thermocouple.

39. A process for producing a crystal article, comprising producing a fluoride crystal article by means of the apparatus for producing a crystal article according to claim 38.

40. A temperature measuring system for measuring temperature of a moving object by means of a thermocouple, wherein;

a connecting part where metal wires and lead wires of the thermocouple are connected and the lead wires are so provided that the temperature at a position where the connecting part and the lead wires are provided is held at 500°C or below.

41. The temperature measuring system according to claim 40, which comprises means by which the position where the lead wires are provided is cooled so that the temperature is held at 500°C or below.

42. The temperature measuring system according to claim 40, wherein the moving object is a crucible.

43. The temperature measuring system according to claim 40, wherein the connecting part where metal wires and lead wires of the thermocouple are connected and the lead wires are provided in a casing for holding the thermocouple, and the casing is set to a member having a temperature of 500°C or below.

44. The temperature measuring system according to claim 40, wherein the connecting part where metal wires and lead wires of the thermocouple are connected is provided in a supporting means for supporting the moving object.

45. The temperature measuring system according to claim 40, wherein the moving object is disposed on the inside of a chamber that can be evacuated, the chamber is provided with an exhaust chamber to which a vacuum pump for evacuating the inside of the former chamber is connected, the connecting part where metal wires and lead wires of the thermocouple are connected is positioned inside the exhaust chamber, and a shielding member is provide between the connecting part and the moving object.

46. A temperature measuring system for measuring by means of a thermocouple the temperature of a moving object provided in a chamber the inside of which is kept vacuum;

the system comprising means by which a feedthrough for extending the thermocouple outside from the chamber is moved together with the moving object.

47. The temperature measuring system according to claim 46, wherein the moving object is a crucible.

48. The temperature measuring system according to claim 47, wherein the crucible is a crucible for producing calcium fluoride.

49. A feedthrough of a thermocouple, used to extend the thermocouple outside from a chamber the inside of which is kept vacuum, the feedthrough comprising:

a feedthrough frame provided at one end of the chamber;

at least one cylinder set in the frame, formed of an insulating material and provided with a through-hole in its axial direction; a metal wire or extension lead wire being passable through the through-hole, which through-hole is sealable with an insulating adhesive after the metal wire or extension lead wire has been

passed through; and

an O-ring provided at least between the cylinder and the feedthrough frame in which the cylinder has been set, to keep the inside of the chamber vacuum.

50. The feedthrough according to claim 49, wherein the metal wire to be passed through the cylinder is a single wire or a pair of wires.

51. The feedthrough according to claim 49, wherein the surface of the feedthrough on the side of the chamber to which surface the cylinder is set flat-top is in the vertical direction or is inclined toward the horizontal direction from the vertical direction.

52. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to lower the rate of movement of the crucible when a discontinuous change does not occur in the temperature in spite of predetermined location or temperature of the crucible.

53. The apparatus according to claim 1, wherein the controlling of the crystal growth furnace is to lower the temperature of the crucible at its bottom center when a discontinuous change does not occur in

the temperature in spite of predetermined location or temperature of the crucible.

54. The apparatus according to claim 18, wherein the controlling of the crystal growth furnace is to lower the rate of movement of the crucible when a discontinuous change does not occur in the heat flow rate in spite of predetermined location or temperature of the crucible.

55. The apparatus according to claim 18, wherein the controlling of the crystal growth furnace is to lower the temperature of the crucible at its bottom center when a discontinuous change does not occur in the heat flow rate in spite of predetermined location or temperature of the crucible.

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